

CLAIMS:

1. A backlighting system for a display apparatus comprising:
 - at least one light source,
 - electronic componentry adapted to receive electrical power and to
 - 5 control the distribution of electrical power to the at least one light source,
 - at least one circuit board substrate on which the electronic
 - componentry is mounted and including an arrangement of conductive tracks,
 - and
 - electrical connection means provided in the circuit board substrate and
 - 10 connected to said conductive tracks,
 - wherein said electrical connection means is directly electrically and
 - physically connected to the at least one light source to conduct said electrical
 - power distributed by the electronic componentry to said at least one light
 - source.
 - 15 2. A backlighting system as claimed in claim 1, wherein said at least one circuit board substrate comprises a first circuit board substrate on which said electronic componentry is mounted and a second circuit board substrate including said electrical connection means which are directly electrically and
 - 20 physically connected to said at least one light source,
 - wherein further electrical connection means are provided between said first and second circuit board substrates.
3. A backlighting system as claimed in claim 2, wherein the light source is provided substantially in a display plan and the first circuit board substrate is

substantially planar and positioned over the at least one light source
substantially parallel with the display plane.

4. A backlighting system as claimed in claim 3, wherein the second circuit board
substrate is arranged substantially perpendicularly to the plane of the first
5 circuit board substrate and the display plane.
5. A backlighting system as claimed in claim 2 or claim 3, wherein said at least
one light source comprises a plurality of tubular light sources having proximal
and distal ends, the tubular light sources aligned in a row and substantially in
the same plane as the first circuit board substrate, the distal ends of the
10 plurality of tubular light sources connected together and to a ground
connection of the electronic componentry and the proximal ends connected to
receive electrical power from the electronic componentry through the electrical
connection means.
6. A backlighting system as claimed in claim 2 or claim 3, wherein said first circuit
15 board substrate includes at least one substantially straight edge adjacent to
which said further electrical connection means is provided, the further
electrical connection means including mechanical connection means provided
on the first circuit board substrate along the substantially straight edge and
including conductive pin means providing at least part of said further electrical
20 connection means.
7. A backlighting system as claimed in claim 6, wherein said mechanical
connection means comprise standard board to board connectors.
8. A backlighting system as claimed in claim 1 or claim 2, wherein said electronic
componentry includes a plurality of control means, each of which control the
25 distribution of power to more than one light source, each control means
receiving feedback of the electrical power consumption of its selected number

of light sources and adjusting the power supplied to the selected number of light sources accordingly.

9. A backlighting system as claimed in claim 8, wherein the electronic componentry includes inverters, each control means controls more than one inverter and each inverter powers more than one light source.
10. A backlighting system as claimed in claim 8 or claim 9, further comprising a cooling means and wherein said control means also receives feedback on a temperature within the display apparatus and adjusts the amount of cooling provided to at least said selected number of light sources by said cooling means accordingly.
11. A backlighting system as claimed in claim 1 or claim 2, wherein the display apparatus is a multi-layer display.
12. A power distribution system for at least one light source within a display apparatus wherein a control means controls the distribution of power to the at least one light source by carrying out the steps of:
- i) detecting the electrical power consumed by the at least one light source,
 - ii) determining whether the electrical power consumed by the at least one light source is within predetermined limits,
 - iii) regulating the electrical power supplied to the at least one light source based upon the detected power consumption to maintain or return the power consumed by the at least one light source between said predetermined limits, and
 - iv) repeating steps (i) to (iv).

13. A power distribution system as claimed in claim 12, wherein the step of regulating the electrical power supplied to the at least one light source comprises providing the light source with a first light source brightness controlling power signal and a second light source current controlling power signal.
14. A power distribution system as claimed in claim 12 or claim 13, wherein said display apparatus includes a plurality of control means, each of which are connected to an associated inverter to control the power distributed to more than one fluorescent light source, wherein a capacitor associated with each fluorescent light source and its associated inverter.
15. A power distribution system as claimed in claim 12 or claim 13, wherein the power consumed by the at least one light source is determined by sensing the current through the at least one light source.
16. A power distribution system as claimed in claim 12 or claim 13, wherein said display apparatus also includes a temperature sensor which provides said control means with an indication of the temperature in the vicinity of the at least one light source and the control means also carries out the steps of:
- ii) determining whether the temperature of the at least one light source is within predetermined limits, and
 - iii) adjusting the power supplied to the at least one light source based upon the temperature indication to maintain or return the temperature of the at least one light source between said predetermined limits.
17. A power distribution system as claimed in claim 14, wherein, the display apparatus also includes cooling means adapted to provide variable cooling to the at least one light source, wherein the control means also carries out the

step of:

iiib) controlling the electrical power supplied to the cooling means based upon the temperature indication to maintain or return the temperature of the at least one light source between said predetermined limits.

- 5 18. A power distribution system as claimed in claim 17, wherein the respective steps of regulating and adjusting the electrical power supplied to the at least one light source and the step of controlling the power supplied to the cooling means occur by pulse width modulating the current or voltage supplied to the at least one light source or the cooling means respectively.
- 10 19. A power distribution system as claimed in claim 18, wherein the pulse width modulation frequency employed in the step of regulating the power supplied to the at least one light source is greater than the pulse width modulation frequency employed in the step of adjusting the power supplied to the at least one light source.
- 15 20. A power distribution system as claimed in claim 18 or claim 19, wherein the pulse width modulation frequency employed in the step of regulating the power supplied to the at least one light source is sufficiently high that the current supplied to the at least one light source, after being filtered by the inverter, is at a substantially constant analogue or DC level.